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ABSTRACT

Qualitative and quantitative research approaches are generally considered to be mutually exclusive. It is possible, however, that a synthesis can be achieved at the level of interpretation and explanation of findings. This paper is divided into four sections to provide: (1) an understanding of explanation and the explanation problem in research; (2) understanding of the unique elements of the explanatory problem of applied research; (3) development of an appropriate explanatory solution; and (4) analysis of an attempt to achieve synthesis. The case study used in the analysis section involved collaboration between researchers from the University of North Carolina-Chapel Hill (UNC-CH) and practitioners from the Charlotte-Mecklenburg Schools. UNC-CH was approached by Charlotte-Mecklenburg officials for help in preparation of a grant proposal for the study of the Charlotte-Mecklenburg Schools teachers' center, the Teaching Learning Center. The design proposed by the co-principal investigators (a Teaching Learning Center staff member and a UNC-CH researcher) used a combination of exploratory, interpretive, verification, and reliability studies. Through their interactions, the two principal investigators assumed the perspectives of each other (i.e., the researcher assumed the concerns of the practitioner, and the practitioner came to understand the abstract interest of the researcher), and explanatory synthesis was approached, if not achieved, during data analysis. (LC)

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WORKING DRAFT

Interpreting the Translation of Data into Explanation: An Attempt at a Synthesis of Quantitative and Qualitative Approaches

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Interpreting the Translation of Data into Explanation:

An Attempt at a Synthesis of Quantitative and Qualitative Approaches

There is much divisiveness in educational research today, in part due to the variety of disciplines engaged in inquiry. Yet intriguing issues of substantive theory, i.e. Marxism or functionalism, seem to be waning while the underlying epistemological issues remain (West, 1981). The debates over the relative (or absolute) merits of phenomenological and more qualitative research versus positivistic and more quantitative research have been with us for years, with no apparent conclusion foreseen. Even with the apparently growing acceptance of such qualitative strategies as case studies with either participant (McPherson, 1972) or non-participant (Metz, 1978) observation, the tendency is to consider quantitative and qualitative as mutually exclusive. This distinction maintains even in synthesis attempts (cf. Sieber, 1973). Certainly, the paradigmatic prominence of positivism promotes the "selling" of qualitative techniques in terms of quantitative concepts (Kuhn, 1962), even though this is often argued to be inappropriate comparison.

This state of affairs seems to defy any reasonable attempts to achieve synthesis. In fact, it can be argued that it is not likely that synthesis can be attained on the levels of data or research techniques where effort thus far has focused. Yet, there is another possibility for a synthesis. It could be that synthesis may be attained in the interpretation and explanation of findings. Unfortunately, the existing synthesis attempts on these levels have been phrased in terms of how "narrative" might help "numbers" (Light and Pillemer, 1982), falling prey to the errors of synthesis attempts on levels of data and technique. It may be that by focusing on interpretation and explanation as processes of human communication a better synthesis can be attained since both types of data

and techniques serve to inform a more holistic human understanding.

Yet explanation and interpretation are not well understood in social science. Fortunately, the recent work of Turner (1980) provides a basis. Yet both Winch (1968) and Turner (1980) have been concerned with "basic" research. We believe that educational research has an additional goal of informing practice and thus is better thought of as "applied" research. As such the interpretive and explanation problems are exacerbated as one attempts to communicate with people who do not share the ideologies, assumptions, disagreements, and concepts that researchers share. Thus to attempt synthesis on the level of interpretation and explanation requires: 1) an understanding of explanation and the explanation problem in research; 2) understanding the unique elements of the explanatory problem of applied research; 3)developing an appropriate explanatory solution; and 4) analyzing an attempt to achieve the synthesis.

The Problem of Interpretation and Explanation

For years, there have been complaints about "abstracted empiricism" and its effect on the substantive theories (Mills, 1959; Coser, 1975). In essence, there are two issues. One is that the emphasis on measurement has transformed theory into instrumental theory suppressing debates of values that give theory its substance (Gouldner, 1970). The other issue is that explanation has become defined in terms of relating variables to one another (Rosenburg, 1968). Defined as such, explanation is technical. The issue of interpretation is limited to the initial hypotheses and to accepted standards concerning inference.

To accept the technical definition of explanation would do little to promote a synthesis of quantitative and qualitative approaches to knowledge. Yet there are other ways to define explanation. Weber, for example, saw two issues: rational explanation and interpretive understanding. Weber (1968: 5) argued:

> All interpretation of meaning, like all scientific observations, strives for clarity and verifiable accuracy of insight and comprehension. The basis for certainty in understanding can be either rational, which can be further subdivided into logical and mathematical, or it can be of an emotionally empathic or artistically appreciative quality. Action is rationally evident chiefly when we obtain a completely clear intellectual grasp of the action-elements in their intended context of meaning. Empathic or appreciative accuracy is attained when, through sympathetic participation, we can adequately grasp the emotional context in which the action took place.

For Weber, you must go beyond establishment of aggregate patterns to achieve an acceptable explanation. Further (1980: 97) agrees:

> Analysis of aggregate patterns can help set puzzles, and differences in aggregate patterns may require explanations that cite differences in practices.

> But the question "Why the different practice" is not touched by the analysis.

Turner (1980) is even more helpful in disclosing what Weber means by appreciative (interpretive) understanding as part of a full "theory of social explanation". This "theory of social explanation" seems to allow the synthesis of quantitative and qualitative approaches on the level of explanation and interpretation. He essentially argues that an adequate explanation sets and solves a comparative "puzzle".

> In defining the puzzle, we proceed as though we hypothesized that where we would follow such and such a rule, the members of another social group or persons in another social context would do the same. This was called the same-practices hypothesis. The puzzle is set by identifying the breakdown in the hypothesis. The explanations that constitute the solutions to these puzzles, it was suggested, are kin to another, a familiar, kind of explanation: the explanation of a game "by describing one as a variation of another -- by describing them and emphasizing their differences and analogies." The different practice in a social group or social context that raises the puzzle is explained in the way that a different rule of a game is explained. (Turner, 1980: 97)

Treating explanation as a case of translation does seem to permit a synthesis. First, it argues that aggregate patterns can set comparative puzzles. Second, that solving the puzzle requires arguing a translation of the observed terms of the typical explanations of the analyst's experience. Yet quantitative and qualitative approaches must be used in conjunction for an adequate explanation to be formulated. Our proposed synthesis then goes beyond arguments about technique and method and argues that a theory of social explanation requires both. Note that this liberates qualitative inquiry from its presumed inferiority and asks quantitative inquiry to set puzzles as well as set standards for inference. Both add roles rather than lose any.

As well as the prospects for a synthesis on the levels of explanation and

interpretation seem, there is an issue that Turner did not explore. Translation as discussed by Turner has holism hidden in it. The holism is actually on two counts. First, that the explanations to be adequate as translations must be sufficiently elaborate to be interpretible to others (a reasonable standard for holism). Second, that it is at the "conjunction" of the observed events with the analyst's explanation of analogous and nonanalogous events in his/her world that the adequcy of an explanation as a translation can be assessed. In short, focus must be on the processes of comparison and analogy making and on the interpretive perspective of the analyst. Interestingly, this synthesis then also allows for an objectivity based in comparison and value-explicitness in the process of translation. Also note that the explanation as tranlation sysnthesis begs the question of the audience to the explanation. His concern was, of course, with a particular type of explanation (sociological) and it could be argued that explanations as translations would be adequately interpretible to others within similar disciplinary paradigms. Yet to achieve a translation adequate as explanation to those who do not share the folk epistemologies of the disciplines has additional requirements. Thus we would argue that while we have a basis for synthesis of quantitative and qualitative approaches on the level of explanatio. and interpretation, the definition of explanation as translation presents a unique communication problem to research intended to inform practice.

The Explanatory Problem of Applied Research

Applied research bridges two dissimilar perceptual orientations: research and practice. Nisbet (1980: 6) writes:

> The tension exists between the two concepts, action and research: action has all the popular qualities -- commitment, involvement, belief, enthusiasm; the qualities needed in research have a more limited appeal -- detachment, suspension of belief, scepticism .... for action, there must be loyalty, and loyalty is "a collusion to maintain the pretence of infallibility"; but research requires a tolerance of heresy, "a willingness to submit the most sacred ideas to the test of reality".

Research and practice vary in other ways, as Shackle (1966: 767) reveals:

> In everyday language and in the language of the policy sciences, decision includes two quite contrasted meanings. Two contrasting psychic activities, two attitudes to life and two different types of mind are involved. There are truth-seekers and truth-makers. On the one hand, the pure scientist deems himself to be typically faced with a problem which has one right answer. His business is in the map-maker's language, to get a fix on that problem, to take bearings from opposite ends of a base-line and plot them to converge upon the solution, the truth to-be-found. On the other hand, the poet-architect-adventurer sees before him a landscape inexhaustibly rich in suggestions and materials for making things, for making works of literature or art or technology, for making policies and history itself, or perhaps for making the complex, delicate, existential system called a business.

To Shackle, applied research must be able to inform possibilities, since policymaking is an "originative" act. He (Shackle, 1966: 758) writes:

> My first proposition is that decision is choice amongst the products of imagination .... All we know or can know concerns what is past .... Everything we know about the future is an inference, the end of a reasoning process, whether

> the reasoning is sound or not. But decision is wholly concerned with the future. Decision is choice of future action aimed at results which we look for in the further future. Thus, decision cannot be the choice of facts. We do not find displayed before us a range of entities which, at one and the same time, are facts already realized and therefore observable, and are also hypotheses, figments, imaginations of what might come true in some future remote or immediate. The questions for the investigator of decision are: (1) Does the past repeat itself? In what sense, and in what circumstances does it do so? How can we tell whether it will repeat itself? For to know that the past is going, in known respects, to repeat itself, is to know some part of the future in those respects. (2) When the kind or degree of repetition that we can rely on are only sufficient to circumscribe, and not to describe with precision and certainty, those aspects of the consequences of present action which concern us, how can we adapt out policy-decision to this lack of knowledge?

The explanatory problem of applied research is involved. Not only must it bridge conceptual worlds, it must also put research in service of the creative aspects of practice. Applied research needs to be facilitative. Further, it must know its place in another way and attempt to assess how practice can adapt to the limitations of research. Of course, this now reveals that our synthesis dramatically changes the role of the researcher by putting the focus on the translation of the perceptual world of the researcher into the perceptual world of the practitioner and vice versa to benefit practice. Turner's explanation as translation involves other translations in applied research: a translation of professional cultures. Further, it is intimately entwined with the relationship of the research and practitioners and the social processes through which an explanatory synthesis is obtained.

An Explanatory Synthesis

We have argued that an explanatory synthesis for applied research is, in actuality, a dual antithesis: not only does explanation require both quantitative and qualitative data and approaches, but also the roles, relations, expectations, and responsibilities of the research and practitioner must be synthesized. This dual synthesis is based in overcoming problems of communication in order to achieve a satisfactory understanding. Thus explanatory synthesis results from real world processes of dialogue and understanding. Mannheim (1936: 152-3) argues:

> .... synthesis in thought styles are not made only by those who are primarily synthesists, and who more or less consciously attempt to comprehend a whole epoch in their thinking. They are achieved also by contending groups insofar as they try to unify and reconcile at least all those conflicting currents which they encounter in their own limited sphere.

Thus to acquire explanatory synthesis for quantitative and qualitative approaches to applied research, it is necessary to consider research design in an elaborate fashion. Research design is more than technical discussions of how to attain appropriate data for a given question, it also includes the structure of social relationships and their appropriateness for achieving the desired synthesis. Unfortunately, we know little about the social relationships involved in applied research. However, our preceeding analysis suggests that, as a beginning, the structure of social relationship, varying perceptions of legitimacy, and a translation gap.

A contrived relationship involves two major issues: the prior and/or external relationships imported into the new relationship and the creation of unique aspects to the relationship. To achieve explanatory synthesis both sets of relationships must be managed in order to achieve a dialogue in which

the researcher and practitioner can advocate their emic perspectives to each other and pursue the translation of one in terms of the other (Schlechty and Noblit, 1982). Varying perceptions of legitimacy are key elements to the emic perspectives of research and practitioner. Practitioners both bow to the mantle of science and bemoan its lack of usefulness. Researchers tend to have a simpler view: legitimacy is to be found in knowledge and expertise and the shared standards concerning them. As a result, the ambivalence of practitioners makes it all too easy to negotiate for the acceptance of the researcher's emic perspectives on what is legitimate. However, to succumb to this exacerbates the translation gap between research and practice. The practitioner still is ambivalent, but the researcher may proceed believing that the relationship presumes his/her perceptions of legitimate research practice. A wide translation gap results but the structure of the relationship may not be renegotiable.

As demonstrated, these dimensions of the social relationships in applied research are interrelated and suggest that applied research, if it is to achieve explanatory synthesis, must think more structurally and processually about the research design and relationship. The promotion of communication and dialogue must have some precedence over the canons of science. If our analysis structure of social relationships in applied research is adequate, then some rudiments of the structure and process to achieve explanatory sysnthesis can be isolated.

All three of the dimensions above involve several issues of social distance. Contrived relationships are often formalistic. Variance in perceptions of legitimacy reveal the disparities in the perceptual "boxes" (Rogers 1978) of researchers and practitioners. The translation gap refers to the problems in communication brought on by the lack of shared concepts and language. Apparently then a research project that will achieve a synthesis must have structures and

processes to minimize social distance between researchers and practitioners. Of course, highly specialized skills may remain problematic.

Similarly, the social relations of applied research have elements of creation and maintenance. That is to say, contrived relationships, perceptions of legitimacy and the translation gap are all subject to some negotiation. If social distance is to be minimized in the presence of such constraints, it would imply that considerable effort needs to be expended to create new social relationships and to maintain them. The efforts at creation and maintenance of that created also must be somewhat extreme if they are to overcome the constraints on the social relations in applied research.

Finally, an explanatory synthesis that is not disseminated and judged useful is of little value. Thus the structure and processes of applied research that yields a synthesis must also yield a product interpretible to the relevant audiences/constituencies. Social distance must be minimized, a unique relationship created and maintained, and an adequate explanation must result.

As our analysis of explanatory synthesis requires that the structure and processes of social relationships in applied research must vary from the social relations in basic research, we have few models to consider. Let us share one attempt of ours.

Application of an Explanatory Synthesis to a Specific Example

We at UNC-CH have been exploring collaborative research and attempting some syntheses of quantitative and qualitative methodologies through a number of research projects (cf. Schlechty and Noblit, 1982; Newman and Noblit, 1982). For our purposes here, we have chosen one study that was sufficiently intensive and could be used to illustrate explanatory synthesis. It came to be called the "TLC Study". Let us briefly describe it, and use the categories developed in the preceding section to organize the features relevant to the thesis of the paper.

In 1981-82, officials from the Charlotte Mecklenburg Schools (CMS) approached the UNC Associate Dean, Phillip Schlechty, asking the university to assist CMS in preparation of a grant proposal. The grant specifications required a collaborative research model between practitioners and researchers be used to study aspects of teachers' centers. The CMS teachers' center, the Teaching Learning Center (TLC), wished to use the grant to consider how they might better link their resources and services with those of a "coordinating teacher" (ct) (recently new role in CMS to coordinate instruction and curriculum in each school). A proposal was developed by the future Co-Principal Investigators (TLC staff member and university research) and submitted to the Far West Laboratory for Educational Research and Development which managed the grant program for the National Institute of Education. Since CMS viewed this as their only opportunity to study this issue, they wished as comprehensive a study as possible. The resulting design used a combintation of exploratory, interpretive, verification, and reliability studies. Documenting usage patterns by teachers and coordinating teachers based on newly sign-in data cards (the "usage study"), intensive Co-P.I. discussions of the TLC's interest, ideas and data, and preliminary analysis of the intensive interviews of coordinating teachers were all exploratory studies. The final analysis of the interview data developed an interpretive theory that encompassed

the available data. The survey of the population of coordinating teachers tested key elements of the interpretive theory (verification study) and was also a realiability study (Newman, Noblit and Schlechty, 1982).

Minimizing social distance

Minimum social distance is almost inherent in the design required by the Far West Lab. The specified collaborative approach had been variously conceived in other funded studies, but our approach was to have joint decision making in the form of the two co-principal investigators. We had agreed on a goal that served the interests of the TLC and was of interest to the researcher but his expertise was to be research methodology.

The researcher became a facilitator and assumed the concerns of the practitioner, just as the practitioner came to understand the more abstract interest of the researcher. Further, the variance of the world views of the researcher and practitioner were explored and mutually understood. The modified roles also involved the CTs and teacher as sources of data, informants, collaborators, and verifiers. Further, these practitioners were used in coding, data analysis, and instrument development.

Two further notes perhaps deserve special attention. First, the highly technical function of computer programming was contracted out. However, the program was structured through discussions of the Co-PIs, written in rough programming format, and was discussed with programmer. Second, the first draft of report was written by the university professor, more the result of the researchers comfort with writing than with other factors. The report had been outlined in detail, the data analyzed in appropriate order, and tentative conclusions speculated prior to the writing.

The maintenance effort

Many moderately task-oriented meetings (weekly day-long for one year) were required to effect the explanatory synthesis using the quanitative and qualitative methodologies required in the study.

These meetings not only served as a system of checks and balances between the respective roles, but also dominated by discussing of each PI's perspectives and translating them to the other. In short, we practiced explanatory translation.

Study design, instrumentation, data collection were all conducted collaboratively in these day-long meetings. Other practitioners meet with the research team, assist in interviewing, interview coding and data analysis. Graduate students from the university joined to help facilitate the study. In short, a lot of us spent a lot of time together with a shared task. The Co-PIs attained equal status. Shared tasks and equal status are the basis of understanding and respect. (Allport, 19)

Adversity and verification

Based on an earlier experience (Schlechty and Noblit, 1982), there was agreement that effort needed to be focused on establishing a dialogue between the researcher and practitioner. Equal status, shared tasks, practicing translations combined for a busy but dynamic exchange. Yet the maintenance of these were put to a vital test as the data analysis ensued. Values were threatened; research revealed as unable to "answer" questions of value, and explanatory synthesis was approached, if not achieved, through processes of adversity and verification.

We have come to call this experience as the "refutation of data and beliefs." The collaborative and full study designs (explanatory through reliability) required a dialogue and a continuous "testing" of our beliefs with data. The usage study

contradicted some hopes but in all was explicable to the team. The early interview data analysis had supervisors of the school-based coordinating team subject their beliefs to their analysis of what the anonymous interview data revealed and meant. The later analyses of the interview data and the usage study were designed to develop a "theory" about what was the CTs role, and how it intersected with the TLC. This interpretive study yielded a theory that could be tested in key ways by quantitative data. The survey instrument development revealed the limitations of research for the originative world of practice (Shackle, 1966), and caused a dialogue in which research was critically examined. The survey data constra ted with our interpretive theory was both exhilarating and devastating. We believed we knew something, it made sense and the data revealed a coherent, credible story (House, 1980). Yet the survey was the adjudicating study also and both Co-PIs felt the end of dialogue approaching. We had explanatory synthesis fully sufficient for our purposes and we prepared to disseminate what we believed we knew.

Dissemination

The "conclusions chapter", when completed by the Co-PIs, was given to two CTs' supervisors, 8 CTs, who served as a "review panel". In general, the review was confirmatory. Yet on one issue (the effect of the principal on the CTs role), the CTs demurred. The Co-PIs reanalyzed their data y dling an analysis confirming the CTs' perspective but with some additional implications for the CTs' role.

The TLC staff read the conclusions chapter and generally verified its analysis. The analyses and results were presented to the population of CTs via their regularly scheduled meetings in each "area" of the CMS system. Suggestions were made; some were rejected, some accepted. The final report was then rewritten and submitted

to the Far West Lab (Newman, Noblit and Schlechty, 1982). We seemingly had obtained an accurate understanding and complex, practical problems were revealed. Some changes in TLC policy and practice resulted, and seem to be appropriately successful.

The explanatory synthesis of quantitative and qualitative approaches seemingly can be achieved in applied research. The proposal preparation explored expectations. The usage study and the early interview analyses set the puzzle based on quantitative logics. These exploratory studies allowed the collaborative relationship to develop and translation (and understanding) was practiced. The later interpretive analyses of the interview data yielded a tentative explanation interpretible both to practitioner and to researcher. This explanation set several puzzles that would "test" the tentative explanation. The survey analysis modified the explanation in some ways, but not dramatically and was based on data from the population of subjects. The puzzles had been set and solved in essentially two iterations. The explanatory synthesis was of interest and useful to CMS, was validated by subjects, and was also received with interest, debate and reasonable acceptance at a conference of all the Far West Lab's teachers center studies.

Conclusions and Implications

What have we attempted to do here? First, we have demonstrated the possibility of a synthesis of qualitative and quantitative approaches on the level of explanation. Second, we have argued that educational research is, in good part, applied research, and that presents a special constraint on achieving an adequate explanation synthesis. Third, we have analyzed some tentative requirements for achieving an explanatory synthesis in applied research. Fourth, we have reviewed one of our recent attempts and analysed how it used processes to minimize social distance, maintain the relationship to structure adversity and verification, and to disseminate it for critical review.

We believe the analyses here have far-reaching implications for educational research. It may point to a "revaluation" of the methodological "camps". It begs for more study of the nature of interpretation and explanation. It suggests directions for studies in research design and methodologies. It calls for a sociology of knowledge in the sociology of education.

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